REMARKS

INTRODUCTION:

The Examiner objected to claims 6 and 26 due to a spelling error.

Claims 1, 9 and 21 were rejected under 35 U.S.C. §112 as being indefinite.

Claims 1-31 were rejected under 35 U.S.C. §103(a) as being unpatentable over USPN 6,284,337 to Lorimor et al. in view of JP 03118198 to Kijima et al., and in view of USPN 6,111,696 to Allen et al.

These rejections are respectfully traversed and reconsideration is requested.

In accordance with the foregoing, claims 1, 6, 9, 11, 15, 21 and 26 have been amended, and new claims 32-34 have been added.

No new matter is being presented, and approval and entry of the foregoing amendments and new claims are respectfully requested.

Claims 1-34 are pending and under consideration. Reconsideration is requested.

OBJECTIONS TO CLAIMS:

In the Office Action at page 2, numbered paragraph 1, the Examiner objected to claims 6 and 26 for informalities. Claims 6, 15 and 26 have been amended to change "transmissibity" or "transmissibility" to --transmissivity-- and are now deemed to be in allowable form.

In addition, claim 11 has been amended to change "a information-recorded substrate" to --an information-recorded substrate--.

REJECTION UNDER 35 U.S.C. §112:

In the Office Action at page 2, numbered paragraph 2, claims 1, 9 and 21 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

It is respectfully submitted that the terms "orientation state" and "nonorientation state" are defined, as set forth on application page 9, line 25 through page 10, line 12:

> "The phrase "be in an orientation state" refers to a state in which main chains or side chains of a polymeric liquid material, or both of them are orientationally arranged in a single direction substantially parallel to the main surface of the latent image formation layer to the extent that a latent image can be fully recognized under visual observation through a polarizing member. Furthermore, the phrase "be in a nonorientation state" refers to a state in which the orientation degree of the main chain and side chain of the liquid crystalline polymer material is low or the

liquid crystalline polymer material per se is not present. Therefore, under the nonorientation state, a latent image cannot be visually observed through a polarizing member."

Claims 1, 9 and 21 have been amended for clarity, in accordance with descriptions on page 19, line 2 to line 28, line 8, page 36, line 1 to page 49, line 26, FIGs. 1-6 and FIGs. 13-22, and are now deemed to be in allowable form.

REJECTION UNDER 35 U.S.C. §103:

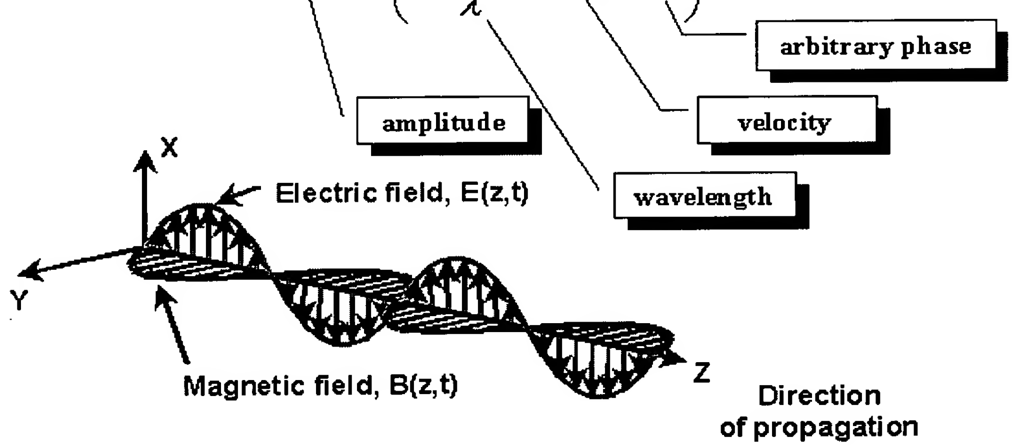
In the Office Action at pages 2-5, numbered paragraphs 3-10, the Examiner rejected claims 1-31 as being unpatentable over USPN 6,284,337 to Lorimor et al. in view of JP 03118198 to Kijima et al, and USPN 6,111,696 to Allen et al.

The rejection is respectfully traversed and reconsideration is requested.

Claims 1, 6, 9, 11, 15, 21 and 26 have been amended for clarity.

First, it may be helpful to note that there are different types of polarization. Light is an electromagnetic wave. Electromagnetic waves have an electric component and a magnetic component. These two components are exactly perpendicular to each other. Thus, in order to fully describe the wave, the amplitude, wavelength, velocity and phase of the wave must be specified.

$$E(z,t) = E_0 \sin\left(-\frac{2\pi}{\lambda}(z - vt) + \xi\right)$$



As the wave is propagating, the wave appears to be a sinusoid from the side (y-z plane). However, if one were to look down the z axis with the wave coming directly to the viewer, the electric field of the wave would appear to be a vertical line along the y axis. The polarization state of the wave

is defined by the orientation and the phase of the E-field vector of the wave. The polarization of the wave can be rotated to any angle. To describe the polarization of the wave, the wave can be projected onto the X and Y axes. When a wave is so defined, there are two components Ex and Ey. When these components are propagating in the same direction, orthogonal and in phase with each other, a linearly polarized wave results.

There are three types of polarization. Linear polarization was described above. There are also circular and elliptical polarization. In circularly polarized light, the two amplitude vectors Ex and Ey are equal in amplitude and 90° out of phase (one reaches a maximum while the other is at a minimum).

In elliptically polarized light, the vectors Ex and Ey take on any arbitrary phase and amplitude. Linear and circular polarization are actually subsets of elliptical polarization.

Linear polarizers cannot distinguish between linear and elliptical polarization; therefore a system using a linear polarizer cannot distinguish between elliptically and linearly polarized light.

In general, elliptical polarization describes the shape of the light beam. To describe the elliptical polarization, there are two numeric values, orientation and ellipticity. These values are related to psi and delta and are independent of the size of the ellipse. Ellipsometric angles psi and delta are obtained by modulating the polarization state of the transmitted beam to produce a time-dependent intensity that is Fourier transformed or otherwise decoded for the polarization state that occurred on reflection. The ellipsometric signal is composed of the DC component and the harmonics components of the modulation frequency. The ellipsometric angles psi and delta are related to the normalized to DC component fundamental and second harmonics of the signal. In other words, these values are independent of the intensity of the two vector components. Two ellipses may have the same value for psi and delta even though one is bigger than the other. The measurement only depends on the polarization change of the light. Kijima et al. utilizes a PVA-iodine film and a dichromatic dye type film that are laminated to a card base material. Typically, such an embodiment provides a linearly polarizing film.

Ellipsometry is superior to alternate methods of thin film measurement such as reflectometry because two parameters (delta and psi) instead of one (intensity) are independently determined in any single measurement. This fact permits the film refractive index to be measured in addition to the film thickness. Two independent parameters also place tighter constraints on models representing more complicated films. In addition, ellipsometric measurements are insensitive to intensity fluctuations of the source, temperature drifts of electronic components, and macroscopic roughness which can be a

serious problem in reflectometry but not in ellipsometry, for which absolute intensity measurements are not required.

Thus, when an elliptically polarized light is used, the accuracy and precision of the measurements are not affected by light source intensity fluctuations. The measurement only depends on the polarization change of the light. Thus, the elliptical polarization of light in accordance with embodiments of the present invention provides a high level of accuracy in contrast to use of linearly polarized light, as is taught by the prior art references.

As recited in amended claims 1, 9 and 21, these inventions respectively recite a laminated composite, an information recording medium, and a member of an imparting forgery-preventing characteristic having a reflective layer and a latent image formation layer that are combined to use with a polarization member. In the embodiment described on line 1 of page 21 through line 5 of page 22 of the specification and as shown in FIG. 5, the latent image formation layer includes two portions. Light first passes through the polarization member (4) and is linearly polarized. Then, a first portion (3a) of the latent image formation layer elliptically polarizes light transmitted therethrough to form elliptically polarized light (6c), and a second portion (3b) of the latent image formation layer does not elliptically polarize light transmitted therethrough to form unelliptically polarized light. The elliptically polarized light (6c) and the unelliptically polarized light are reflected by the reflective layer (2), and again pass through the latent image formation layer. In the first portion, the elliptically polarized light is again elliptically polarized to form elliptically polarized light (6d). In the second portion, the unelliptically polarized light remains unelliptically polarized. When viewed through the polarizing member, a relatively strong contrast is produced between the light from the first portion and the light from the second portion, facilitating recognition of the latent image. Thus, amended independent claims 1, 9 and 21 describe respectively, a laminated composite, a recording medium, and a forgery preventing member that separate transmitted light into elliptically polarized light and non-elliptically polarized light, which, when viewed through a polarizing member, provides a latent image that is not taught or suggested, alone or in combination, by USPN 6,284,337 to Lorimor et al., JP 03118198 to Kijima et al, and/or USPN 6,111,696 to Allen et al.

Independent claims 1, 9, 21 and 32-34 of the present inventions recite "a latent image formation layer with no polarizing member thereon, the latent image formation layer containing a liquid crystalline polymer material."

A thin latent image formation layer may be formed by using the liquid crystalline polymer material. The absence of the polarizing member is one of the necessary conditions for forming the "latent image" defined in claims 1, 9, 21 and 32-34.

Claim 1 of the present application recites "said at least one oriented portion and said at least one non-oriented portion constitute a latent image which is unrecognizable by a direct visual observation of the composite and recognizable by a visual observation of the composite through a polarizing member." Claim 21 recites "said at least one oriented portion and said at least one non-oriented portion constitute a latent image which is unrecognizable by a direct visual observation of the member of imparting a forgery-preventing characteristic and recognizable by a visual observation of the member of imparting a forgery-preventing characteristic through the polarizing member."

As set forth above, claims 1, 9, 21 and 32-34 of the present application do not define the latent image that cannot be recognized by direct visual observation of the latent image formation layer. The "latent image" defined in claims 1, 9, 21 and 32-34 cannot be visualized by any constituent feature included in the laminated composite related to claims 1, 9, 21 and 32-34.

It is difficult for the counterfeiter to notice the latent image because it cannot be recognized by direct visual observation of the laminated composite. The latent image can be recognized by visual observation through the polarizing member of the laminated composite. Thus, it is easy for the latent image to repeat visualization and non-visualization.

In addition, the liquid crystalline polymer material can maintain an orientation state even in a relatively high temperature. Therefore, the latent image has a high thermal stability. When the liquid crystalline polymer material is used, it is possible to produce an orientation state by using heat and pressure.

Claims 1, 9, 21 and 32-34 of the present application also recite that "chains of the liquid crystalline polymer material are orientationally arranged in a single direction substantially parallel to a major surface of the latent image formation layer." That is, the "liquid crystalline polymer material" provided in claims 1, 9, 21 and 32-34 includes liquid crystalline polymer material of a nematic phase or a smectic phase. In other words, the "liquid crystalline polymer material" provided in claims 1, 9, 21 and 32-34 does not include liquid crystalline material of a cholesteric phase in which the liquid crystal molecules form a helical structure.

One of the features of the liquid crystalline material of a cholesteric phase is that it has a selective reflection. That is, the liquid crystalline material of the cholesteric phase may selectively

reflect a light component with a wave length of $\lambda = P/\cos\theta$, where P represents a helical pitch and θ represents a viewing angle with respect to a helical axis. The wave length of λ changes in accordance with the viewing angle θ. Therefore, the color of the liquid crystalline material of cholesteric phase changes in accordance with the viewing angle θ. In this way, if a liquid crystalline material which changes color in accordance with the viewing angle θ is used, it is impossible to form "a latent image which is unrecognizable by a direct visual observation of the composite and recognizable by a visual observation of the composite through a polarizing member" recited in claims 1, 9, 21 and 32-34.

Lorimor et al. (USPN 6,284,337) discloses a security laminate 26 comprising an emblem layer 14. Lorimor et al. utilizes a liquid crystal polymer as the material of an emblem 14. However, as it is clear from the description in Lorimor et al. at column 5, lines 8-50, the liquid crystal polymer is an example of materials which are visible to the unaided eye. That is, Lorimor et al., does not disclose or suggest using the liquid crystal polymer as the material of the emblem layer 14 that is transparent to the unaided eye but is visible when viewing the emblem through a viewing device, as is provided by the present inventions.

As is clear from the description in Lorimor et al. at column 5, lines 14-18, the liquid crystal polymer changes color in accordance with a viewing angle. That is, although Lorimor et al. discloses the liquid crystalline material of cholesteric phase, it does not disclose "liquid crystalline polymer material..., ... chains of the liquid crystalline polymer material are orientationally arranged in a single direction substantially parallel to a major surface of the latent image formation layer," as is recited for the present inventions.

In the abstract, Kijima et al. (JP03118198) discloses laminating a metal reflecting layer 3, a polymer liquid crystal layer 4 and a polarizing film 5, one after another, on a card base material 2. As is clear from the above, the lamination of the polarizing film 5 onto the polymer liquid crystal layer 4 makes it impossible to form the "latent image" defined in independent claims 1, 9 and 21 of the present application.

Allen et al. (USPN 6,111,696) discloses a display comprising an LCD panel and a polarizer. That is, the disclosure in Allen et al. is unrelated to the present inventions.

As is clear from the above, neither Lorimor et al., Kijima et al., Allen et al. nor the combinations of those references teach or suggest the inventions related to claims 1, 9, 21 and 32-34 of the present application. Therefore, it is respectfully submitted that clams 1, 9, 21 and 32-34 and claims 2-8 that

depend from claim 1 of the present inventions are allowable over the cited references. In addition, similarly, claims 9-31 and 32-34 are allowable over the cited references.

Hence, since claims 2-8, 10-20 and 22-31 depend from amended claims 1, 9 and 21, respectively, it is respectfully submitted that claims 1-31 of the present inventions are not obvious under 35 U.S.C. §103 in view of USPN 6,284,337 to Lorimor et al. in view of JP 03118198 to Kijima et al, and USPN 6,111,696 to Allen et al.

In addition, with respect to claims 4, 5, 12, 13, 14, 23 24 and 25, it is respectfully submitted that Lorimor et al. fails to teach or suggest the additional optical layer as used in those present inventions and fails to teach or suggest a thermotropic type of liquid crystalline polymer. There is no teaching or suggestion of combining Lorimor et al. and Kijima et al. Hence, through Kijima teaches using a liquid crystal polymer layer of a thermotropic type, Kijima does not teach the present inventions, and there is no reason to combine the teachings of Lorimor et al. and Kijima et al.

With respect to claim 11, Lorimor et al. does not teach or suggest the light reflective substrate and laminated card having an optical layer facing the latent image. Since Kijima et al. was published in May, 1991, if Lorimor et al. had recognized the optical layer on the latent image liquid crystal polymer layer of Kijima et al. as beneficial, Lorimor et al. had the opportunity to utilize it. Hence, it is respectfully submitted that it was not obvious to Lorimor et al. to do so.

There is no teaching or suggestion of combining Allen et al., Lorimor et al. and/or Kijima et al., and even if combined, the references do not teach or suggest the present inventions (see above arguments). It is respectfully submitted that the courts have held that the Examiner may not suggest modifying references using the present inventions as a template absent a suggestion of the desirability of the modification in the prior art. *In re Fitch*, 23 U.S.P.Q.2d 1780, Fed Cir. 1992. Something in the prior art as a whole must suggest the desirability, and thus, the obviousness, of making the combination. *Alco Standard Corp. v. Tennessee Valley Authority*, 808 F. 2d 1490, 1 U.S.P.Q. 2d 1337 (Fed. Cir. 1986). When a rejection depends on a combination of prior art references, there must be some teaching, suggestion or motivation to combine the references. *In re Geiger*, 815 F.2d 686, 688 2 U.S.P.Q.2d 1276, 1278 (Fed. Cir. 1987). Thus, since there is no teaching or suggestion of combining Lorimor et al and/or Kijima et al. and/or Allen et al., and even if combined, it is submitted that the combination does not teach the present inventions, it is respectfully submitted that claims 1-31 as well as new claims 32-34 are patentable under 35 U.S.C. §103 over same.

NEW CLAIM:

New claims 32-34 recite:

A laminated composite comprising: an optical layer having a light reflectivity; and a patterned latent image formation layer with no polarizing member thereon, the patterned latent image formation layer containing a liquid crystalline polymer material and provided on one of major surfaces of the optical layer, wherein chains of the liquid crystalline polymer material are orientationally arranged in a single direction substantially parallel to a major surface of the patterned latent image formation layer, and wherein said patterned latent image formation layer and an opening portion of the patterned latent image formation layer constitute a latent image which is unrecognizable by a direct visual observation of the composite and recognizable by a visual observation of the composite through a polarizing member.

An information recording medium comprising: a light reflective substrate with a light reflective surface; and a patterned latent image formation layer with no polarizing member thereon, the patterned latent image formation layer containing a liquid crystalline polymer material and provided on the light reflective surface, wherein chains of the liquid crystalline polymer material are orientationally arranged in a single direction substantially parallel to a major surface of the patterned latent image formation layer, and wherein said patterned latent image formation layer and an opening portion of the patterned latent image formation layer constitute a latent image which is unrecognizable by a direct visual observation of the medium and recognizable by a visual observation of the medium through a polarizing member.

A member of imparting forgery-preventing characteristic comprising: a base layer; an optical layer provided on one of major surfaces of the base layer and having a light reflectivity; and a patterned latent image formation layer with no polarizing member thereon, the latent image formation layer containing a liquid crystalline polymer material and provided on the optical layer, wherein chains of the liquid crystalline polymer material are orientationally arranged in a single direction substantially parallel to a major surface of the patterned latent image formation layer, and wherein said patterned latent image formation layer and an opening portion of the patterned latent image formation layer constitute a latent image which is unrecognizable by a direct visual observation of the member of imparting

forgery-preventing characteristic and recognizable by a visual observation of the member of imparting forgery-preventing characteristic through a polarizing member.

Nothing in the prior art teaches or suggests such. It is submitted that the new claims distinguish over the prior art.

CONCLUSION:

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot, and further, it is respectfully submitted that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any additional fees associated with the filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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